

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A pipe segment [[(22)]] for transporting a hot particulate material, such as hot iron ore fines, in a carrier gas in a transfer line, which said pipe segment [[(22)]] includes:

(a) an outer pipe section [[(2)]];
(b) an inner pipe section [[(4)]] defining a passageway [[(6)]] for a hot particulate material and a carrier gas, the inner pipe section [[(4)]] being positioned within the outer pipe section [[(2)]], and the inner pipe section [[(4)]] being formed from or having an inner lining of an abrasion resistant material; and
(c) a support means supporting the inner pipe section [[(4)]] in relation to the outer pipe section [[(2)]] so that the inner pipe section [[(4)]] can expand axially relative to the outer pipe section [[(2)]] in response to temperature changes in the material being transported in the pipe segment [[(22)]], the support means including a first support means located at one end of the pipe segment [[(22)]], the first support means including a support member that can receive an end of an inner pipe section [[(4a)]] of an adjacent pipe segment [[(22a)]] when the adjacent pipe segment [[(22a)]] is positioned in use in end to end relationship with the said pipe segment [[(22)]] and can allow axial expansion of that inner pipe section [[(4a)]] relative to the outer pipe section of the said adjacent pipe segment [[(22a)]] in response to temperature changes in the material being transported in the said adjacent pipe segment [[(22a)]].

2. (Currently Amended) A pipe segment according to claim 1, characterized in that wherein the support member encloses and extends axially

from one end of the inner pipe section [[(4)]] of the said pipe segment [[(22)]] and can receive and enclose the end of the inner pipe section [[(4a)]] of the adjacent pipe segment [[(22a)]] when the said adjacent pipe segment [[(22a)]] is positioned in use in end to end relationship with the said pipe segment [[(22)]] and can allow axial expansion of at least that inner pipe section [[(4)]] while the ends remain enclosed within the support member.

3. (Currently Amended) ~~[[A]]~~The pipe segment according to claim 1 or 2, ~~characterized in that, wherein~~ the support member forms a seal with the ends of the inner pipe sections [[(4, 4a)]] of the said pipe segment [[(22)]] and the said adjacent pipe segment [[(22)]].

4. (Currently Amended) ~~[[A]]~~The pipe segment according to any of the preceding claims, ~~characterized in that~~ claim 1, wherein the support member includes an inwardly facing cylindrical surface for contacting the outer surfaces of the ends of the inner pipe sections [[(4, 4a)]] of the said pipe segment [[(22)]] and the said adjacent pipe segment [[(22a)]].

5. (Currently Amended) ~~[[A]]~~The pipe segment according to any of the preceding claims, ~~characterized in that~~ claim 1, wherein the support member is in the form of a sleeve [[(8)]] having the inwardly facing cylindrical surface.

6. (Currently Amended) ~~[[A]]~~The pipe segment according to any of the preceding claims, ~~characterized in that~~ claim 1, wherein the support member is directly connected only to the outer pipe section [[(2)]] of the said pipe segment [[(22)]].

7. (Currently Amended) ~~[[A]]~~The pipe segment according to any of the preceding claims, ~~characterized in that~~ claim 1, wherein the support

member is directly connected to both the outer pipe section [[(2)]] and the inner pipe section [[(4)]] so that the end of the inner pipe section [[(4)]], but not the remainder of the inner pipe section [[(4)]]], is constrained from axial expansion relative to the outer pipe section at that end of the pipe segment [[(22)]].

8. (Currently Amended) ~~[[A]]~~The pipe segment according to any of the preceding claims, ~~characterized in that~~ claim 1, wherein the first support means also supports the inner pipe section [[(4)]] in relation to the outer pipe section [[(2)]].

9. (Currently Amended) ~~[[A]]~~The pipe segment according to any of the preceding claims, ~~characterized in that~~ claim 1, wherein the first support means defines a barrier to movement of gas axially along the space between the inner and outer pipe sections [[(4, 2)]] of the pipe segment [[(22)]].

10. (Currently Amended) ~~[[A]]~~The pipe segment according to claim 9, ~~characterized in that~~ wherein the first support means includes a frusto-conical barrier member [[(10)]] having a larger diameter end that is welded or otherwise connected to the outer pipe section [[(2)]] of the said pipe segment [[(22)]] and a smaller diameter end that is welded or otherwise connected to the support member.

11. (Currently Amended) ~~[[A]]~~The pipe segment according to claim 10, ~~characterized in that~~ wherein the frusto-conical barrier member [[(10)]] is arranged so that the larger diameter end is located at the end of the outer pipe section [[(2)]] and the smaller diameter end is located inwardly of the end of the inner pipe segment [[(4)]].

12. (Currently Amended) ~~[[A]]~~The pipe segment according to any of the preceding claims, ~~characterized in that~~ claim 1, wherein the support

means includes a second support means positioned at a location along the length of the pipe segment [[(22)]] between the ends of the pipe segment [[(22)]] and it supports the inner pipe section [[(4)]] in relation to the outer pipe section [[(4)]] for axial expansion relative to the outer pipe section [[(2)]].

13. (Currently Amended) [[A]]The pipe segment according to claim 12, characterized in that wherein the second support means also supports the inner pipe section [[(4)]] in relation to the outer pipe section [[(2)]] so that the inner pipe section [[(4)]] can expand radially relative to the outer pipe section [[(2)]].

14. (Currently Amended) [[A]]The pipe segment according to claim 12 or 13, characterized in that, wherein the second support means is welded or otherwise connected to the outer pipe section [[(2)]] and the inner pipe section [[(4)]].

15. (Currently Amended) [[A]]The pipe segment according to claim 12 or 13, characterized in that, wherein the second support means is welded or otherwise connected to the outer pipe section [[(2)]] only.

16. (Currently Amended) [[A]]The pipe segment according to claim 12 or 13, characterized in that, wherein the second support means is welded or otherwise connected to the inner pipe section [[(4)]] only.

17. (Currently Amended) [[A]]The pipe segment according to any of claims 12 to 16, characterized in that claim 12, wherein the second support means functions as a spring that provides a resistance to radial expansion of the inner pipe section relative to the outer pipe section.

18. (Currently Amended) [[A]]The pipe segment according to any of claims 12 to 16, characterized in that claim 12, wherein the second support means is in the form of a plurality of rods [[(14)]], each of which is bent so as to

function as a spring, that are positioned at spaced intervals around the circumference of the inner and outer pipe sections [[(4, 2)]] at a location along the length of the pipe segment [[(22)]].

19. (Currently Amended) [[A]]The pipe segment according to any of claims 12 to 16, characterized in that claim 12, wherein the abrasion resistant material of the inner pipe section [[(4)]] is a cast iron.

20. (Currently Amended) [[A]]The pipe segment according to claim 19, characterized in that wherein the inner pipe section [[(4)]] is made of an wear-resistant and/or abrasion resistant material, e.g. cast iron.

21. (Currently Amended) [[A]]The pipe segment according to any of claims 12 to 16, characterized in that claim 12, wherein the outer pipe section [[(2)]] is formed from a steel.

22. (Currently Amended) [[A]]The pipe segment according to any of claims 12 to 16, characterized in that claim 12, wherein the pipe segment [[(22)]] further includes thermal insulation (36, 38, 42, 46) in the space between the inner and outer pipe sections [[(4, 2)]].

23. (Currently Amended) A transfer line for transporting hot particulate material, such as iron ore fines, in a carrier gas, which transfer line includes a plurality of pipe segments [[(22)]] according to any of claims 1 to 22 claim 1.

24. (Currently Amended) [[A]]The transfer line according to claim 23, characterized in that wherein the plurality of pipe segments [[(22)]] are positioned in an end to end relationship with the ends of adjacent outer pipe sections [[(22a)]] welded or otherwise connected together, and the end of one of each pair of

adjacent inner pipe sections [[(4, 4a)]] extending into and engaging the support member of the other of the pair of adjacent inner pipe sections [[(4, 4a)]].

25. (Currently Amended) A process for transporting a hot particulate material in a carrier gas in a direct smelting plant for producing molten metal from a metalliferous feed material, ~~in particular~~ comprising, transporting between a pretreatment unit and solid delivery means in the form of lances [[for]], injecting the material into a direct smelting vessel, ~~characterized in that~~ and wherein the material is transported in at least one transfer line according to claim 23 [[or 24]].

26. (Currently Amended) [[A]]The process according to claim 25, ~~characterized in that~~ wherein the hot particulate material is iron ore fines with a reduction grade between 0 and 100% ~~and preferably a reduction grade between 8 and 95%~~.

27. (Currently Amended) [[A]]The process according to claim 25 [[or 26]], ~~characterized in that~~ wherein the hot particulate material is at a temperature between 200 and 850°C ~~and preferably between 300 and 850°C~~.

28. (Currently Amended) [[A]]The process according to ~~any of~~ claims 25 to 27, ~~characterized in that~~ claim 25, wherein the carrier gas is at least substantially N₂.

29. (Currently Amended) [[A]]The process according to ~~any of~~ claims 25 to 28, ~~characterized in that~~ claim 25, wherein the hot particulate material ~~is ore fines~~ are transported along the transfer line at a minimum velocity of at least 19 m/s by the carrier gas, and [[are]]~~is~~ injected into a direct smelting vessel with the carrier gas having a lance tip velocity in the range of 70 — 120 m/s.